

What is claimed is:

1. A method of heating gases cooled by an aftercooler receiving hot gases from a compressor, the method comprising the steps of:

5 (a) directing a portion of said hot gases to a bypass means for by-passing the aftercooler,

(b) using said bypass means to direct hot gases to a location receiving cooled gases exhausted from the aftercooler for use at a location downstream from the aftercooler, and

10 (c) using said hot gases bypassed by the bypass means to heat the cooled gases exhausted from the aftercooler.

2. The method of claim 1 wherein step (a) includes the step of using a pipe as said bypass means to bypass the aftercooler.

15 3. The method of claim 1 wherein step (b) includes the step of using said bypass means to mix hot gases from the compressor with cooled gases from the aftercooler.

4. The method of claim 3 wherein step (b) includes using a
20 three-way valve as said bypass means for gas mixing and by-passing the aftercooler.

5. The method of claim 4 wherein step (b) includes using a temperature sensitive device to operate said three-way valve in response to ambient temperature conditions.

6. Apparatus for heating gases cooled in an aftercooler connected to receive hot gases from a compressor, the apparatus comprising:

5 means connected to receive a portion of such hot gases from such compressor for directing said portion of said hot gases around such aftercooler and to a predetermined location receiving cooled gases from such aftercooler, while a remainder of such hot gases is sent to such aftercooler from such compressor for cooling,

10 such hot gases being effective to heat such cooled gases at such receiving location.

7. The apparatus of claim 6 wherein said means for bypassing such aftercooler is a pipe connected to and between such compressor and such location receiving such cooled gases.

15 8. The apparatus of claim 7 wherein said apparatus further includes a preset safety valve connected to such compressor, with an internal size of said pipe being such that upon blockage of such aftercooler due to freezing of moisture in such aftercooler, said pipe will pass hot gases to such location ordinarily receiving cooled gases from such aftercooler in an amount sufficient to
20 prevent said safety valve from operating.

9. The apparatus of claim 6 wherein said means for bypassing such aftercooler includes a three-way valve having two ports connected respectively to receive hot gases from such

compressor and cooled gases from such aftercooler, and an outlet port for directing a mixture of such gases from said valve.

10. The apparatus of claim 6 wherein said apparatus further includes a temperature sensitive means for controlling an amount of hot gases by-passed around such aftercooler and to such location for receiving cooled gases from such aftercooler.

11. The apparatus of claim 10 wherein said temperature sensitive means is a thermostat located in a three-way valve connected to receive both hot and cooled gases.

10 12. The apparatus of claim 10 wherein said temperature sensitive means includes an electrical switch connected to receive a temperature representing signal.

15 13. The apparatus of claim 12 wherein a magnet valve is connected to receive hot gases from such compressor for operating said means for bypassing such aftercooler, with said electrical switch being connected to said magnet valve for operating said magnet valve in response to receipt of a temperature representing signal.

20 14. The apparatus of claim 7 wherein said pipe connected to receive hot gases from such source of hot gases and to direct same to a location for receiving cooled gases from such aftercooler,

communicates such hot gases in an amount effective to heat such cooled gases exhausting from such aftercooler, and to bypass completely such aftercooler if moisture freezes in such aftercooler.

5 15. The apparatus of claim 9 wherein said three-way valve supplies a mixture of such gases to an output pipe when ambient temperature falls to or close to freezing.

10 16. The apparatus of claim 15 wherein said three way valve includes a thermostat for controlling flow of compressed gases to maintain a temperature of such mixture of such gases flowing to a reservoir.

15 17. The apparatus of claim 15 wherein said apparatus further includes a magnet valve connected to receive hot compressed gases from such source of such gases, and use same as a control gas for operating said three-way valve.

20 18. The apparatus of claim 17 wherein said apparatus further includes a switch electrically connected to a magnet of said magnet valve, said switch being effective to control energization and deenergization of said magnet based upon temperature signals received by said switch representing ambient, freezing and above freezing temperatures.

19. A method of by passing an aftercooler connected to receive high temperature compressed air from a source of such air, the method comprising the steps of:

5 (a) connecting (1) a first port of a three-way valve to such source of high temperature air, (2) a second port of such valve to such aftercooler, and (3) a third port of such valve to an output pipe, and

10 (b) opening said valve between said first and second ports to conduct high temperature air through said valve to said third port when ambient temperature is near, at or below freezing, and to close said valve when ambient temperature is above freezing.

20. The method of claim 19 wherein said method include the additional step of using a magnet valve to provide control air for said three-way valve for operating said three way valve in response
15 to changes in ambient temperature.

21. The method of claim 19 wherein said method includes the additional step of using a thermostat located in said three-way valve to open and close said valve.

22. The method of claim 20 wherein said method include the
20 additional step of using a switch to energize said magnet valve when said switch receives a temperature signal representing an ambient freezing condition.